



**TSM Symposium
Oxford
September 2005**

TSM and MSX

How do they fit together ?

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Agenda

- Part 1
 - History
 - MSX Overview
 - Data Model
 - AD Integration
 - Single Instance Store

- Part 2
 - Traditionell Backup
 - Brick Level Problem
 - MAPI Backup
 - Exmerge Backup

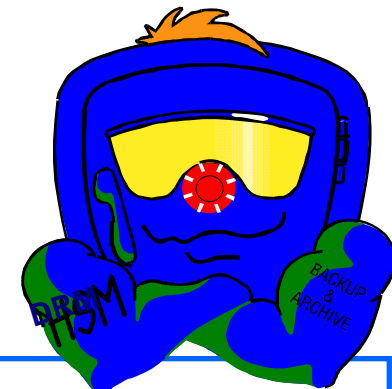
- Part 3
 - New technologies
 - VSS and VDS
 - Summary

Do you remember?

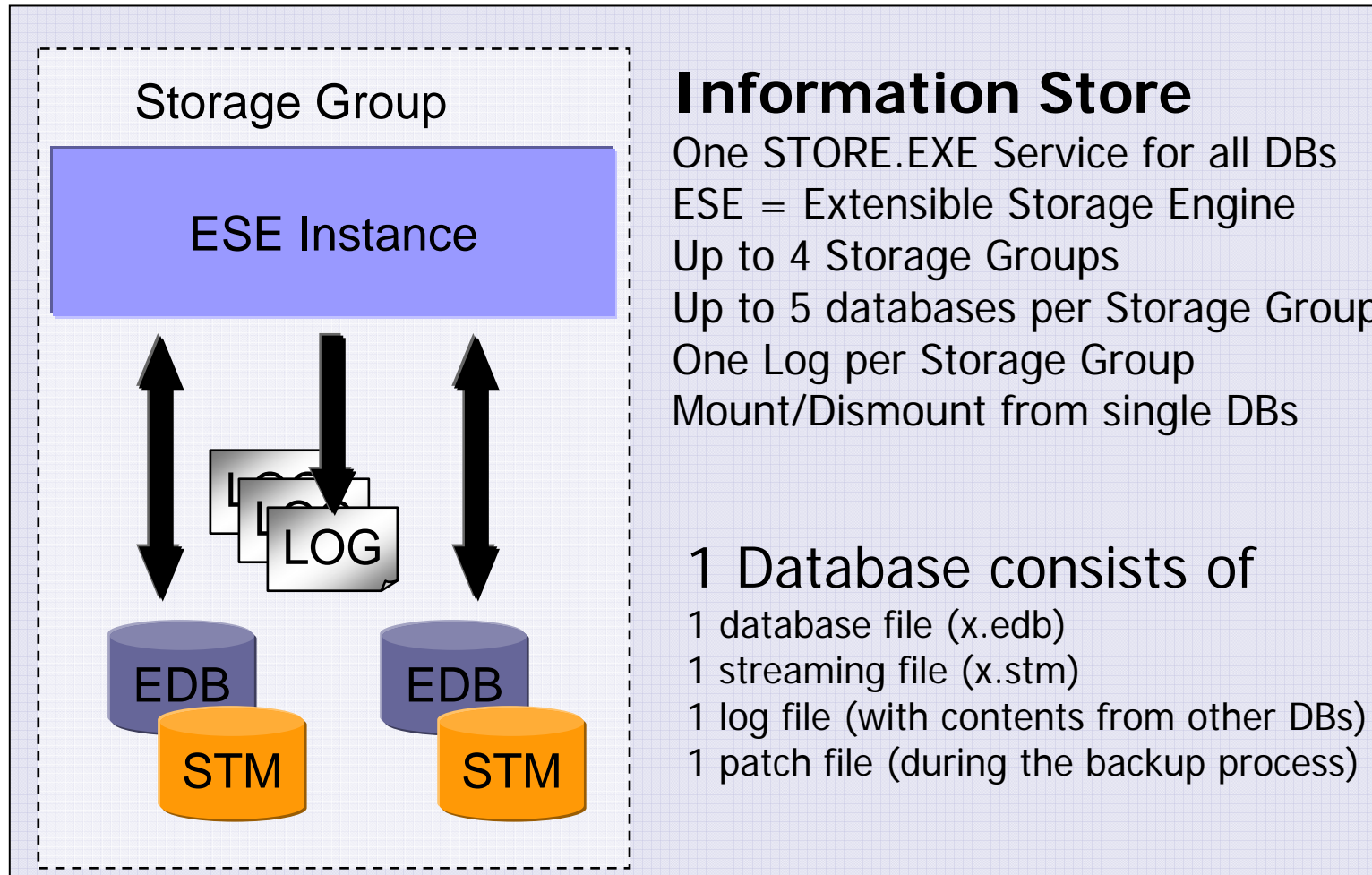
Name	Version	Release Date
Exchange 4.0	4.0.837	April 1996
Exchange 4.0 (a)	4.0.993	August 1996
Exchange 4.0 SP1	4.0.838	May 1996
Exchange 4.0 SP2	4.0.993	August 1996
Exchange 4.0 SP3	4.0.994	November 1996
Exchange 4.0 SP4	4.0.995	April 1997
Exchange 4.0 SP5	4.0.996	May 1998
Exchange 5.0	5.0.1457	March 1997
Exchange 5.0 SP1	5.0.1458	June 1997
Exchange 5.0 SP2	5.0.1460	February 1998
Exchange 5.5	5.5.1960	November 1997
Exchange 5.5 SP1	5.5.2232	July 1998
Exchange 5.5 SP2	5.5.2448	December 1998
Exchange 5.5 SP3	5.5.2650	September 1999
Exchange 5.5 SP4	5.5.2653	November 2000
Exchange 2000	6.0.4417	October 2000
Exchange 2000 (a)	6.0.4417	January 2001
Exchange 2000 SP1	6.0.4712	July 2001
Exchange 2000 SP2	6.0.5762	December 2001
Exchange 2000 SP3	6.0.6249	August 2002
Exchange 2000 post-SP3	6.0.6487	September 2003
Exchange 2000 post-SP3	6.0.6556	April 2004
Exchange 2000 post-SP3	6.0.6603	August 2004
Exchange Server 2003	6.5.6944	October 2003
Exchange Server 2003 SP1	6.5.7226	May 2004

GA 24.4.1998

ADSM Connect Agent 1.1.0.0b	March 1999
TDP for Exchange 1.1.1.0	November 1999
TDP for Exchange 2.2.0.0	March 2001
TDP for Exchange 5.1.5.0	Oktober 2002
ITSM for Mail 5.2.1	September 2003



MSX Overview



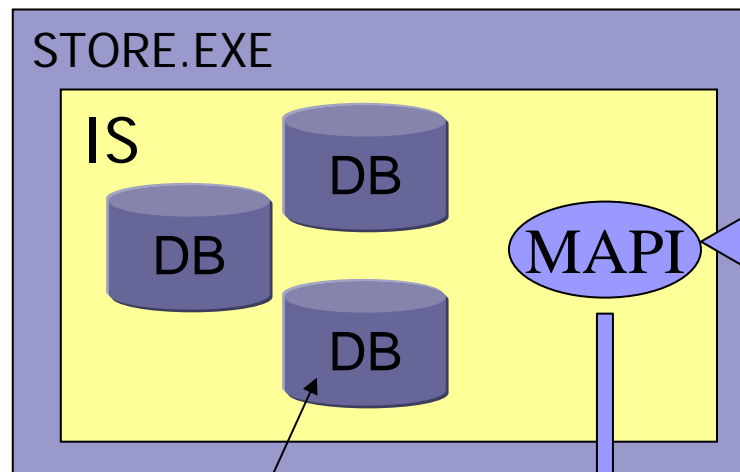
Information Store

One STORE.EXE Service for all DBs
 ESE = Extensible Storage Engine
 Up to 4 Storage Groups
 Up to 5 databases per Storage Group
 One Log per Storage Group
 Mount/Dismount from single DBs

1 Database consists of

- 1 database file (x.edb)
- 1 streaming file (x.stm)
- 1 log file (with contents from other DBs)
- 1 patch file (during the backup process)

Incoming Mail



There are no mailboxes !!!

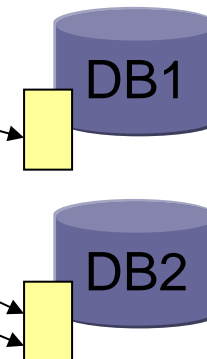
1. The MTA (Message Transfer Agent) receives an eMail and connects to the Exchange Server via the MAPI
2. MSX looks in the Active Directory (AD) for the recipients
3. MSX stores the eMail in the database where the recipient is defined as a mailbox entity

Incoming Mail



cn=Robbie, ou=db1
cn=Susan, ou=db2
cn=Peter, ou=db2

mailto: Robbie, Susan, Peter
(Robbie's mailbox is in DB1,
Susan's and Peter's mailbox is in DB2)



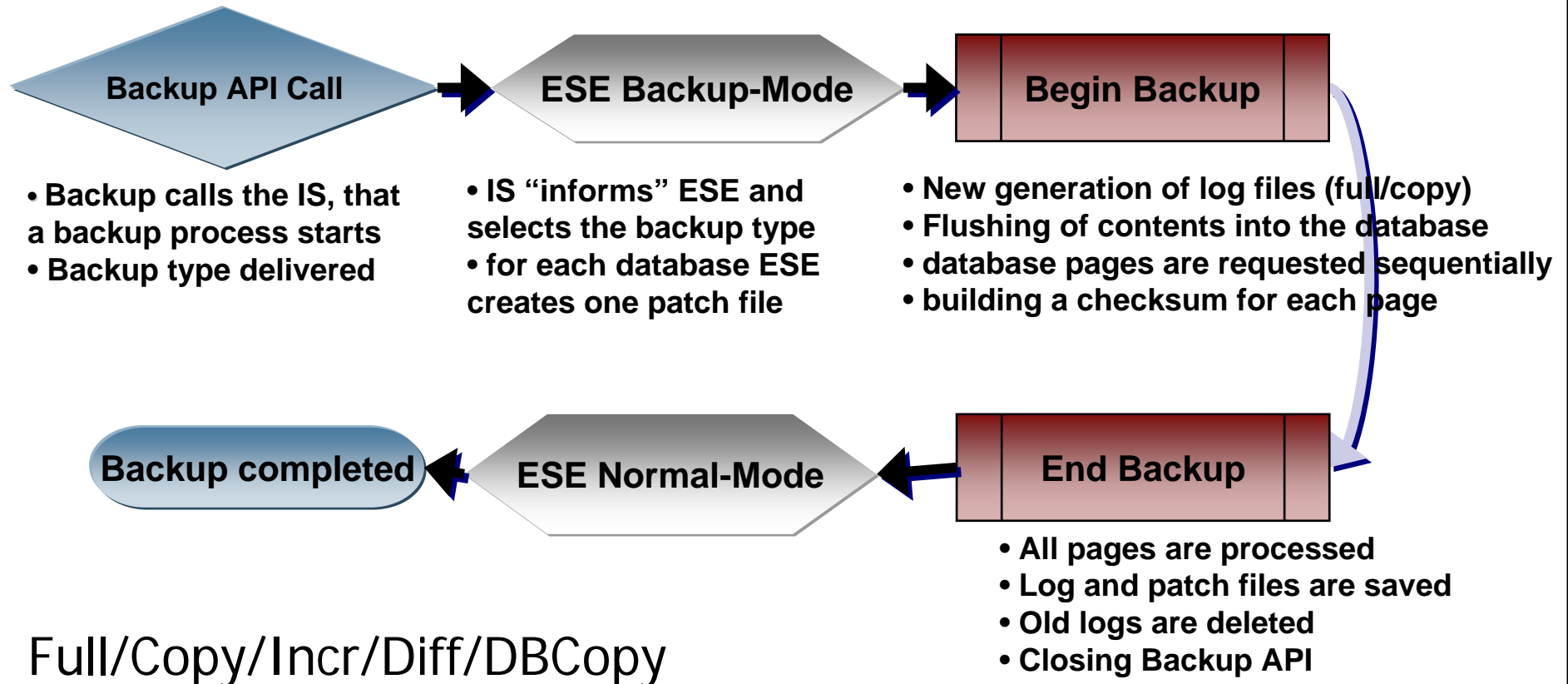
Problem 1: One copy of the mail is stored in DB1, but only one copy in DB2 (Single Instance Store)

Problem 2: The same mail is stored in two different databases

What happens when one of them deletes „his/her“ copy ??

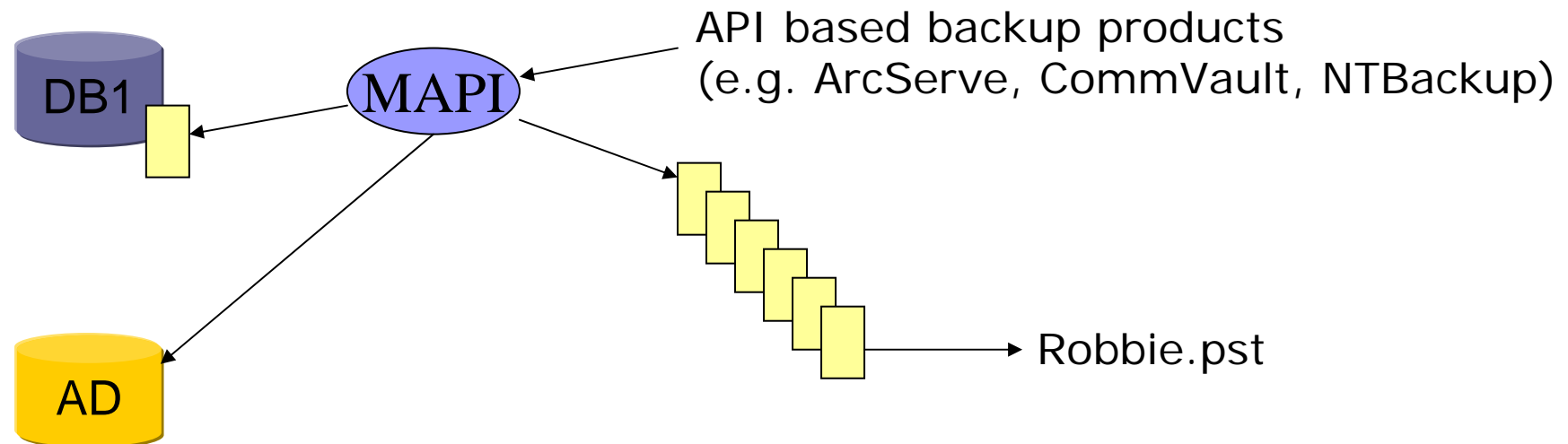
Backup over API

This is the only supported backup method from Microsoft ITSM for mail is using this backup API



Backup over MAPI

The Backup over the Message API (MAPI) is not supported.
Often called „Brick Level Backup“



1. Backup of the „mailbox“ from Robbie
2. Extracts one mail by another by traversing all objects
3. Stores the mails in a local file robbie.pst

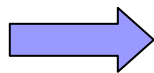
Restore over MAPI

Often called „Individual Mailbox Restore“ (IMR)

1. The „mailbox“ from Robbie is accidentally deleted
2. The admin starts an IMR over MAPI
3. The MAPI will store each single mail in a new mailbox
4. Over the AD the mailbox will be mounted over the new mailbox
5. The mailbox is back.

BUT:

If a mail has more than one recipient, the MAPI will store a copy of the mail in all recipients mailboxes. „Zombie Mails“ are created.



A mail with 500 recipients will store a copy of the mail in 500 mailboxes. The 499 other users will see the mail twice.

(All storage vendors like this behaviour)

Exmerge Backup

Microsoft Exchange Mailbox Merge Program, v6.5.7408.1
(„Yet another MAPI program = YAMP“)

- Free of charge MAPI tool from Microsoft
- Extracts all or selected Mailboxes from the IS
- Stores *.pst files in the filesystem (no security protection)
- TSM can backup/archive the *.pst files regularly
- Exmerge makes sense in addition to TSM (e.g. daily TSM API backup, weekly Exmerge extraction and archive)
- Can merge new mails into the existing *.pst file (incremental)

But:

- Very, very slow ca. 1GB/h (a job for the weekend ?)
- Only recommended for selected mailboxes (CEO, or other people who can't accept a NO)
- The extracted *.pst file is 20-50% bigger than the mailbox
- Do you use „Personal Folder“ or „Persönliche Ordner“ ?

Recovery Storage Group

A new feature within MSX 2003 (running on W2000 and W2003).
There is no longer the need for a „standby server“ for API Restores.

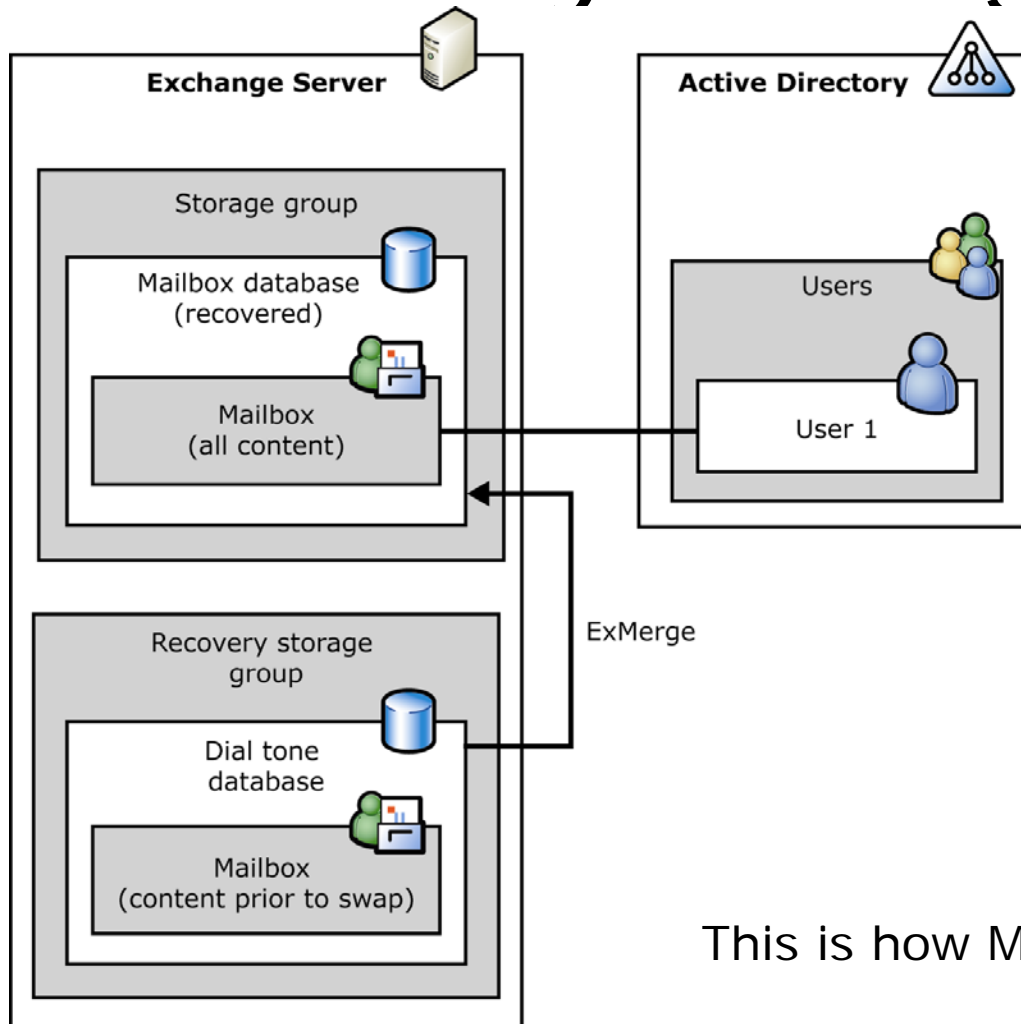
Recovery scenarios are:

- Recovering deleted items that a user mistakenly purged from their mailbox.
- Recovering or repairing an alternate copy of a database while another copy remains in production (typically, with the goal of merging data between the two databases using the ExMerge tool).
- Recovering a database on a server other than the original server for that database.

It is not for ..

- Restoring public folders
- Restore the entire server

Recovery Storage Group



Database restore using a „Dial Tone Database“

1. Generate a new database (serving already mail clients)
2. Restore the database into the Recovery storage group
3. Swap the databases
4. Use ExMerge to „merge“ the remaining mails

This is how Microsoft are doing their restore.

Recovery Storage Group

Restoring a single mail or a single mailbox

To recover data from a mailbox in the recovery storage group, the mailbox must reside in the original database from which the database backup you are restoring was generated.

Restore the database (where the mailbox resides)

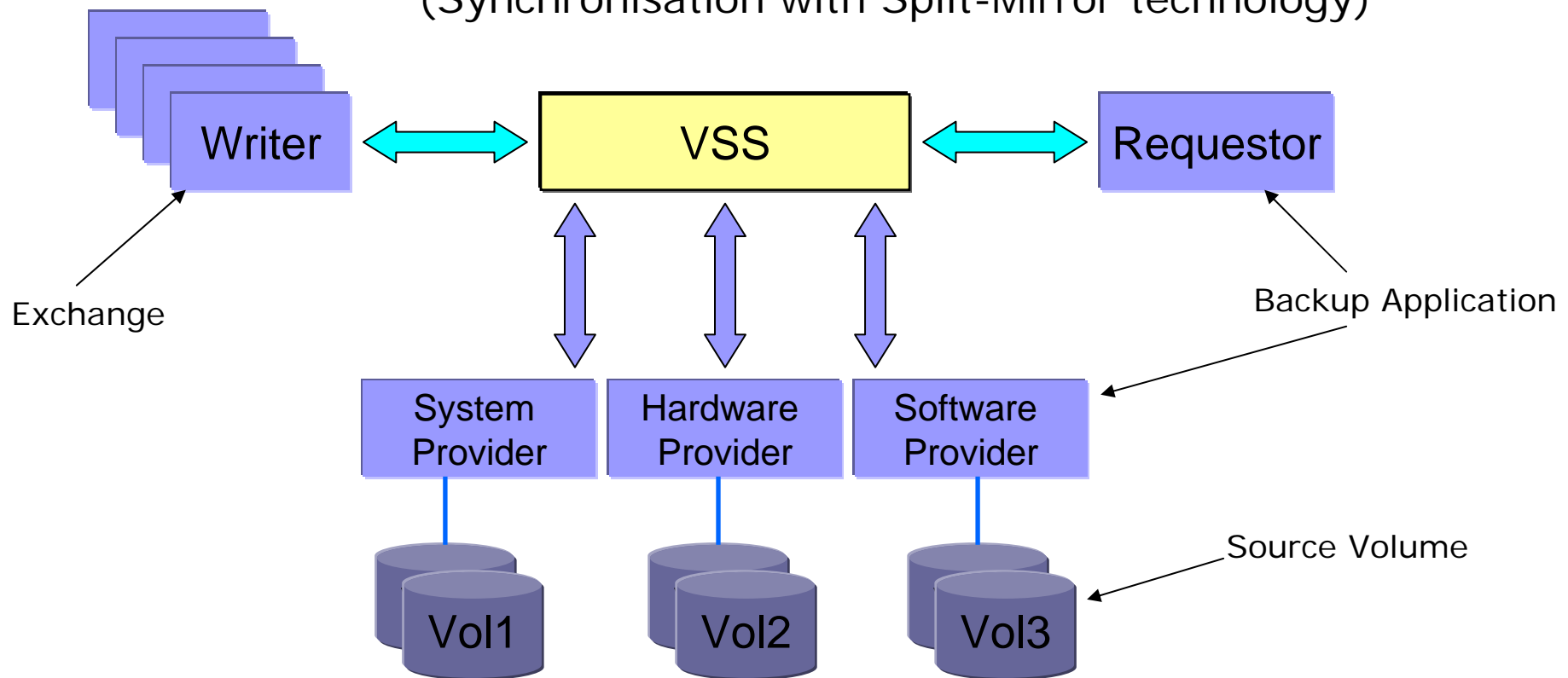
Use Exmerge to „merge“ the lost mail/mailbox into the original DB

If a mailbox is deleted but still not purged, then connect the merged mailbox to any account in the AD. This is like an undelete.

If a mailbox is already purged, then you have a lot of work to do.
(see Exchange Technical Guide).

Backup using VSS

VSS – Volume Shadow Copy Service – is part of Windows 2003
 (Synchronisation with Split-Mirror technology)



Possibilities of VSS (today)

VSS supports Clone (Full Copy/Split Mirror) and Copy-on-write (Differential) copies

TSM LANfree integration

- VSS Copy
- Mount of the target volume from another server doing the backup
- Resync
- This is done in minutes

Server-Free (?)

- VSS Copy
- Mount of the target volume from a TSM Server (must read NTFS)
- Resync

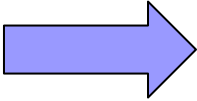
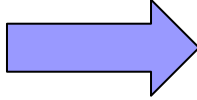
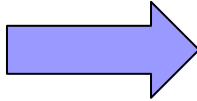
Microsoft VDS – Virtual Disk Service – is needed !!

„Limitations“ of VSS

- Only on Windows 2003
- The whole information store must be backed up (no single DB)
- But you can restore a single DB from a VSS Clone
- No intermix of backups allowed (API or VSS Backup)
- No Recovery Storage Group possible
- Restore to another AD forest is supported
- The IS must be offline during restore
- The Exchange writer supports incr,diff,copy and full backups
- During VSS copy the Exchange Server is freezed
- Disk Space is 1:1 for the copy
- Supports MSCS

Summary

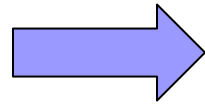
„What do you want to restore today ?“

1. Single item / mail  Recycle bin of the user where a deleted mail stays for several days or use of the Recovery Storage Group (API Restore necessary)
2. Single mailbox (deleted)  MSX Mailbox Recovery Wizard (a deleted mailbox stays 30 days)
3. Single mailbox (purged)  Recovery Storage Group (Restore of a DB copy with the mailbox and all items)

Summary

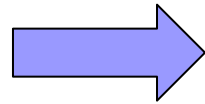
„What do you want to restore today ?“

4. Database



Recovery Storage Group
or API Restore or VSS Restore

5. Information Store

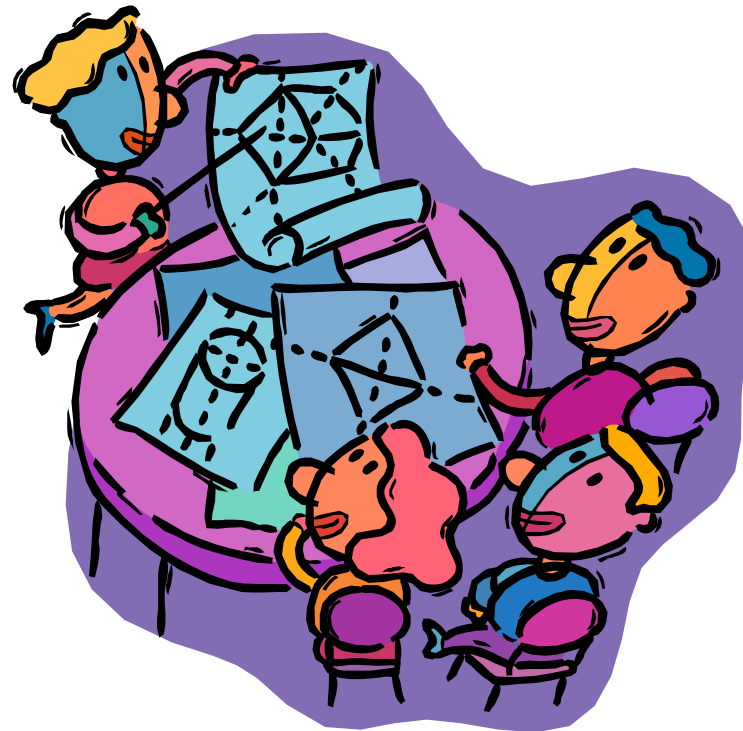


API Restore or VSS Restore

You have a bunch of tools to fulfill all requested service levels.
(It depends of how much money you want to spent).

In all cases: you should be a friend of Exmerge !!!

Questions ???



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